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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,653	07/28/2003	Sai P. Katikaneni	B429-060	4416

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EXAMINER

LAWRENCE JR, FRANK M

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,653

Applicant(s)

KATIKANENI ET AL.

Examiner

Frank M. Lawrence

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,11-23 and 25-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 40 and 41 is/are allowed.
- 6) ☒ Claim(s) 1-6,8,11-14,19-23,25-28 and 30-39 is/are rejected.
- 7) ☒ Claim(s) 15-18 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. The indicated allowability of previous claim 10 is withdrawn in view of the newly discovered reference(s) to Wakita et al. (6,579,347). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 11-14, 19-22, 25, 26, 30-33 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al. '598 in view of Wakita et al. (6,579,347).

4. Chow et al. '598 teach a system for removing sulfur compounds from a hydrocarbon fuel stream, comprising a container (4) with a first adsorbent bed (6) that can be a zeolite adsorbent for removing hydrogen sulfide and primary sulfur compounds such as higher molecular weight organic sulfur compounds from the stream, a second adsorbent bed (8) including a supported nickel or copper adsorbent for removing secondary sulfur compounds such as DMS from the stream, and a third adsorbent bed (10) that can include activated carbon or a zeolite for removing both primary and secondary sulfur compounds. Two of the containers can be used in series or in parallel for continuous use of one bed while the other is being regenerated or replaced, and adsorption can take place at 150-750° C (see figure, abstract, paragraphs 40-51). A parallel arrangement will necessarily require conduits and valves to control gas flow. The instant claims

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differ from the disclosure of Chow et al. '598 in that the second adsorbent bed comprises a sodium form zeolite.

5. Wakita et al. '347 disclose a method for removing sulfur compounds from natural gas, comprising using a sodium form zeolite to adsorb dimethyl sulfide (abstract, col. 1, line 58 to col. 2, line 5, col. 4, lines 34-41, col. 5, line 45 to col. 6, line 37). It would have been obvious to one having ordinary skill in the art at the time of the invention to use a sodium form zeolite as the second adsorbent bed of the Chow et al. '598 system in order to provide a material that is known to be effective for adsorbing dimethyl sulfide while being capable of extended use and regeneration.

6. Claims 4-6, 8, 23, 27, 28, 34, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al. 598 in view of Watika et al. '347 as applied to claims 1, 20, 31 and 36 above, and further in view of Hanamoto et al. '398.

7. Chow et al. '598 in view of Watika et al. '347 discloses all of the limitations of the claims except that the first adsorbent comprises copper-chromium based activated carbon with at least 5 wt% Cu and at least 2 wt% Cr and that the process has preferred bed sizes, pressures and flow rates. Hanamoto et al. '398 disclose an activated carbon carrying 0.1-20 wt% of at least one metal including copper and chromium that is useful for adsorbing mercaptans (abstract, col. 1, lines 44-67). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the system of the primary references by using a copper-chromium based activated carbon in place of the first adsorbent in order to provide an adsorbent that causes little pressure loss and is capable of sufficiently removing mercaptans in low concentrations. Absent a proper showing of criticality or unexpected results, the process sizes, flow rates, and pressures

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are considered to be parameters that would have been routinely optimized by one having ordinary skill in the art at the time of the invention in order to achieve a high rate of adsorption at the lowest relative cost of energy and materials.

Allowable Subject Matter

8. Claims 40 and 41 are allowed.

9. The following is an examiner's statement of reasons for allowance: Claim 40 includes material previously indicated as allowable and still deemed allowable. Specifically, the prior art of record fails to suggest a motivation for using a lead lag valve arrangement in the system of claim 40.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

10. Claims 15-18 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments with respect to claims 1, 20, 31, 36 and their dependents have been considered but are moot in view of the new ground(s) of rejection. Because material previously indicated as allowable has been rejected, this action is non-final.

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Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional references listed on the attached PTO-892 form disclose adsorbents for sulfur compounds.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Lawrence whose telephone number is 571-272-1161. The examiner can normally be reached on Mon-Thurs 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frank M. Lawrence
Primary Examiner
Art Unit 1724

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Frank Lawrence
9-14-05